REMARKS

Claims 1-32 were pending in this application. Claims 1-32 stand rejected. Claims 1-7, 17, and 27 were amended. Claims 33-36 were added. Claims 1-36 remain in the application.

Claims 1-9 and 12-32 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Koba (US 6,222,947) in view of Johnson (US 2001/0019630). The rejection states:

> "As per independent claim 1, Koba teaches a digital image album layout system comprising:
>
> "a page creator module have a first program algorithm operable to execute calculations on a first population of image criteria, said page creator module having a page evaluation module operable to test said first population for fitness to album preference criteria (col 6, lines 43-59) and
>
> "an image placement module having a second program algorithm operable to execute calculations on a second population of page layout criteria, said image placement module having a layout evaluation module operable to test said second population for fitness to page preference criteria (col. 7, lines 37-41).
>
> "Koba does not disclose the first program algorithm and the second program algorithm to implement genetic programming technique. Johnson discloses genetic programming method is used for image classification basing on a variety of image types (page 14 and 15, [0212]-[0231]). It would have been obvious to an artisan at the time of the invention to use the teaching from Johnson of applying genetic programming in Koba's system since the advantages of the Genetic Programming approach include its robustness to changing environment, its low demand for data, and its computational speed."

Claim 1 states:

> 1. A digital image album layout system comprising:
>
> a page creator module operable to receive a set of images and user preferences and to generate album preference criteria using said user preferences, said page creator module having a first genetic engine operable to execute genetic evolution calculations on a

first genetic population of image criteria, said page creator module having a page evaluation module operable to test said first genetic population for fitness to said album preference criteria, said page creator module being operable to distribute said images to a plurality of album pages responsive to said testing for fitness to said album preference criteria;

an image placement module operable to receive the set of images and user preferences and to generate page preference criteria using said user preferences, said page creator module having a second genetic engine operable to execute genetic evolution calculations on a second genetic population of page layout criteria, said image placement module having a layout evaluation module operable to test said second genetic population for fitness to said page preference criteria, said image placement module being operable to distribute said images on respective said album pages responsive to said testing for fitness to said page preference criteria.

Claim 1 is supported by the application as filed, notably the original claims and at Figure 1; page 9, lines 3-6; page 1, lines 18-21; page 16, line 29 to page 17, line 3; page 19, lines 12-19; page 23, lines 12-19; page 30, lines 26 to page 31, line 1; page 7, line 28 to page 8, line 2.

Claim 1 requires a page creator module operable to generate album preference criteria using user preferences. The page creator module has a first genetic engine operable to execute genetic evolution calculations on a first genetic population and a page evaluation module operable to test the first genetic population for fitness to the album preference criteria. The page creator module is also operable to distribute the images to a plurality of album pages responsive to the testing. Claim 1 also requires an image placement module operable to generate page preference criteria using user preferences. The page creator module has a second genetic engine operable to execute genetic evolution calculations on a second genetic population of page layout criteria and a layout evaluation module operable to test the second genetic population for fitness to the page preference criteria. The image placement module is also operable to distribute the images on respective album pages responsive to the testing.

The cited references do not teach or suggest these features. Johnson does not disclosure the use of genetic evolution calculations, that is, genetic algorithms, in image classification, but rather the use of fuzzy logic. (The use of genetic programming for a more limited purpose is taught in Johnson, paragraph 0221, which is discussed below.) Fuzzy logic and genetic algorithms are both examples of neural networks, but otherwise differ in approach.

Fuzzy logic uses preset rules. Genetic algorithms and genetic programming do not. A definition of fuzzy logic states:

> 'fuzzy logic
>
> 'A mathematical technique for dealing with imprecise data and problems that have many solutions rather than one. Although it is implemented in digital computers which ultimately make only yes-no decisions, fuzzy logic works with ranges of values, solving problems in a way that more resembles human logic.
>
> 'Fuzzy logic is used for solving problems with expert systems and realtime systems that must react to an imperfect environment of highly variable, volatile or unpredictable conditions. It "smoothes the edges" so to speak, circumventing abrupt changes in operation that could result from relying upon traditional either-or and all-or-nothing logic. {definition continues}' (Computer Desktop Encyclopedia, 9th ed., A. Freedman, Osborne/McGraw-Hill, New York, (2001), page 382)

A definition of genetic programming states:

> 'genetic programming
>
> 'A type of programming that imitates genetic algorithms, which uses mutation and replication to produce algorithms that represent the "survival of the fittest." While genetic algorithms yield numbers, genetic programs yield ever-improving computer programs. Written in languages such as LISP and Scheme, genetic programming requires the determination of a fitness function, which is a desired output (result). The degree of error in the fitness function determines the quality of the program. {definition continues}' (Computer Desktop Encyclopedia, 9th ed., A. Freedman, Osborne/McGraw-Hill, New York, (2001), page 389)

A definition of genetic algorithm is provided in U.S. Patent No. 5,048,095:

'Genetic algorithms are known in art. The term genetic algorithm is derived from the fact that its operations are loosely based on the mechanics of genetic adaptation in biological systems. Genetic algorithms can be briefly characterized by three main concepts: a Darwinian notion of fitness or strength which determines an individual's likelihood of affecting future generations through reproduction; a reproduction operation which produces new individuals by combining selected members of the existing population; and genetic operators which create new offspring based on the structure of their parents.

'A genetic algorithm maintains a constant-sized population of candidate solutions, known as individuals. The initial seed population from which the genetic process begins can be chosen randomly or on the basis of heuristics, if available for a given application. At each iteration, known as a generation, each individual is evaluated and recombined with others on the basis of its overall quality or fitness. The expected number of times an individual is selected for recombination is proportional to its fitness relative to the rest of the population. Intuitively, the high strength individuals selected for reproduction can be viewed as providers of "building blocks" from which new, higher strength offspring can be constructed.' (col. 4, line 60 to col. 5, line 17)

Johnson, on pages 14-15, paragraphs 0212-0231, discloses the use of fuzzy logic in image compression. Johnson presents a definition of fuzzy logic that is like the definition quoted above:

"Fuzzy logic is a set-theoretic approach to classification of objects that assigns degrees of membership in a particular class. In classical set theory, an object either belongs to a set or it does not; membership is either 100% or 0%. In fuzzy set theory, an object can be partly in one set and partly in another. (Johnson, page 14, paragraph 0216)

The fuzzy logic image classifier of Johnson operates using sets of rules. Johnson states:

'The fuzzy logic image classifier 152 receives the image data and determines a set of image measurements which are mapped onto one or more input sets. The image classifier 152 in turn maps the input sets to

corresponding output sets that identify which compression methods to apply. The output sets are then blended ("defuzzified") to generate a control script 196. The process of mapping the input image to a particular control script 196 thus requires three sets of rules: 1) rules for mapping input measurements onto input sets ... ; 2) rules for mapping input sets onto output sets ... and 3) rules for defuzzification that mediate between membership of several output sets ...' (Johnson, page 14, paragraph 0220)

Johnson does not teach use of a genetic algorithm, but rather that genetic programming can be used to extend the rule base used in the fuzzy logic image classifier. Johnson states:

"Still further, the fuzzy logic rule base is easily maintained. The rules are modular. Thus, the rules can be understood, researched, and modified independently of one another. In addition, the rule bases are easily modified allowing new rules to make the image classifier 152 more sensitive to different types of image content. Furthermore, the fuzzy logic rule base is extendable to include additional image types specified by the user or learned using neural network or genetic programming methods. " (Johnson, page 14, paragraph 0221; emphasis added)

This paragraph discloses use of genetic programming, rather than use of a genetic algorithm in classification. The genetic programming is used to extend the database of fuzzy logic rules in the classifier.

In contrast, Claim 1 requires a page creator module that is operable to distribure images responsive to testing of a first genetic population following genetic evolution calculations and an image placement module that is operable to distribute images responsive to testing of a second genetic population following genetic evolution calculations. The two different modules distribute images two different ways. Different criteria are used for testing in the two modules, but in both cases, the testing is of fitness to criteria generated using user preferences.

The mention in Johnson, of the use of genetic programming also teaches or suggests that Johnson was aware of both genetic programming and genetic algorithms (see the above definitions) and, despite that knowledge, chose to use fuzzy logic in the classifier. Possible reasons for that decision are presented in the office action (as edited to correctly refer to Johnson's approach to classification as fuzzy logic):

"the advantages of the {fuzzy logic} approach include its robustness to changing environment, its low demand for data, and its computational speed." (page 3)

These purported advantages of fuzzy logic contradict the rejection.

Claim 1 also requires modules operable to test the genetic populations for fitness to preference criteria generated using user preferences. This contrasts with Koba, in which preferences are used to set initial parameters, then:

"the automatic layout means 31 executes automatic layout processing on the basis of the initial parameters". (Koba, col. 7, lines 37-39; see also the discussion of the setting of initial parameters at Koba, col. 6, line 21 to col. 7, line 36; emphasis added)

(This is like the rules base approach of Johnson, but unlike the claimed invention. Compare the discussion at Johnson, page 14, paragraphs 0212-0221, with the determining steps S104-S106 of Koba (discussed at Koba, col. 3, line 66 to col. 4, line 44).)

In Koba, the automatic layout is followed by evaluation by the user. Koba states:

"The layout result on all the pages having undergone automatic layout processing in this manner is displayed on a display device 8 in step S210. In step 211, the user is caused to input information indicating whether to confirm the layout result on all the pages with a keyboard 7.

"If the user does not confirm the result, i.e., designates the execution of modification, in step S211, the user is caused in step S212 to input information indicating whether to modify all pages or one page." (Koba, col. 7, lines 48-56)

In Koba, when the user does not confirm the result, submitted input information is used to reset initial parameters for a repeat of the processing. (Koba, col. 7, lines 56-67) The requirement in Claim 1 of modules that are operable to test genetic populations for fitness to preference criteria generated using user preferences is not taught by Koba's displaying layouts to a user and asking for more information if the user objects to the displayed layout. In Koba, the initial parameters

determine the processing. The resulting layout is not then tested against the parameters used to create it. The layout is instead tested by user review.

Claims 29-30 are allowable as depending from Claim 1.

In relation to Claims 2-3 the office action states:

'As per independent claim 2, Koba teaches an automated album layout method responsive to a set of inputs containing digital images, graphics, and other 2-dimensional objects, comprising the steps of:

'evaluating a grouping of the image objects for distribution into a number of album pages according to a fitness function's parameters of a program algorithm (col. 6, lines 43-59);

'assigning each image object to a page based on user preferences, including balance (col. 6, lines 52 – col. 7, lines 13);

'displaying said page for user viewing, and refining the distribution based on further user action (S210 of fig. 4 and fig. 5C and 5G).

'Koba does not disclose the program algorithm to implement genetic programming technique. Johnson discloses genetic programming method is used for image classification basing on a variety of image types (pages 14 and 15, [0212] – [0231]). It would have been obvious to an artisan at the time of the invention to use the teaching from Johnson of applying genetic programming in Koba's system since the advantages of the Genetic Programming approach include its robustness to changing environment, its low demand for data, and its computational speed.'

As per independent claim 3, Koba teaches an automated layout and presentation method responsive to a set of inputs containing digital images, graphics, and other two-dimensional objects, comprising the steps of:

'evaluating the 'x' and 'y' position coordinates, scale, and rotation of each of the input images objects within a page according to fitness function parameters in a program algorithm (col. 7, lines 37-41);

'creating a page layout based on user preferences including rotation (col. 7, lines 37-41);

'displaying said page layout for user viewing; refining said page layout based on further user action (S210 of fig. 4 and fig 5C and 5G), and formatting the page layout printing (col 8, lines 12-14).

'Koba does not disclose the program algorithm to implement genetic programming technique. Johnson discloses genetic programming method is used for image classification basing on a variety of image types (pages 14 and 15, [0212]-[0231]). It would have been obvious to an artisan at the time of the invention to use the teaching from Johnson of applying genetic programming in Koba's system since the advantages of the Genetic Programming approach include its robustness to changing environment, its low demand for data, and its computational speed.'

Claims 2-3 state:

2. An automated album layout method responsive to a set of inputs containing digital images, graphics, and other 2-dimensional objects, comprising the steps of:

evaluating a grouping of the image objects for distribution into a number of album pages using a genetic algorithm, according to parameters of a fitness function;

assigning each said image object to a page based on user preferences, including at least one of; balance, emphasis, chronology, and unity;

displaying said page for user viewing, and

refining the distribution based on further user action.

3. An automated layout and presentation method responsive to a set of inputs containing digital images, graphics, and other two-dimensional objects, comprising the steps of:

evaluating the 'x' and 'y' position coordinates, scale, and rotation of each of the input images objects within a page using a genetic algorithm, according to parameters of a fitness function;

creating a page layout based on user preferences including at least one of; white space, overlap, rotation, spatial balance, rotational balance, border symmetry, and emphasis;

displaying said page layout for user viewing;

refining said page layout based on further user action,

and

formatting the page layout printing.

Claims 2-3 are supported by the application as filed, notably the original claims, Figure 2, and page 4, lines 5-6.

Claims 2 and 3 each require evaluating a grouping of particular features of image objects using a genetic algorithm, according to parameters of a fitness function. As discussed above, the cited references do not teach or suggest such use of a genetic algorithm.

Claims 4-7, 17, and 27 are supported by the application as filed, notably the original claims and at page 16, line 27 to page 17, line 3; page 19, lines 12-19; page 23, lines 12-15. Claims 4-7, 17, and 27 are allowable on grounds like those discussed above in relation to Claims 1-3. Unlike the cited references, each of Claims 4-7, 17, and 27 requires specifying (or means for specifying) initial page assignments and/or placement parameters of a plurality of images to a genetic population, evolving (genetic engine operable to evolve) the genetic population, and testing (module-to test) the evolved population with a fitness function generated (module-to generate) using user preferences. Claims 4-6 also require that modules are operable to generate respective fitness functions using user preferences. Claims 4-6 are also allowable on the grounds discussed above in relation to similar language in Claim 1.

Claims 28 and 31-33 are allowable as depending from Claim 7. Claim 34 is allowable as depending from Claim 17. Claim 35 is allowable as depending from Claim 27.

Claims 33-35 are also allowable on the grounds discussed above in relation to Claims 4-6.

Claims 8, 12, 14, 18, 22, and 24 are allowable on the grounds discussed above. Notably, these claims requires initializing and evolving a genetic population of page assignments/positioning parameters of images and testing using a fitness function. Johnson teaches use of fuzzy logic rules rather than a genetic algorithm (and, optionally, use of genetic programming in rules base modification). (Johnson, pages 14 and 15, paragraphs 0212-0231) Koba teaches automatic layout based on initial parameters from a user, followed by user review and optional submission of modifications (i.e. new

initial parameters) and a repeat of the process. (Koba, col. 7, lines 37-39; 53-59)

Claims 9 and 13 are allowable as depending from Claim 8.

Claim 15 is allowable as depending from Claim 14.

Claim 16 is allowable as depending from Claim 14 and as above discussed.

Claims 19-21, 23, and 25 are allowable as depending from Claim 18.

Claim 26 is allowable as depending from Claim 24 and as above discussed.

Claims 10 and 11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Koba in view of Johnson and further in view of Wang (US 6,014,458).

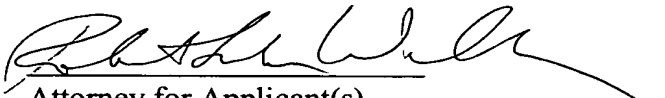
Claims 10-11 are allowable as depending from Claim 8.

Added Claim 36 is supported and allowable on the same grounds as Claim 1.

It is believed that these changes now make the claims clear and definite and, if there are any problems with these changes, Applicants' attorney would appreciate a telephone call.

In view of the foregoing, it is believed none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,



Attorney for Applicant(s)
Registration No. 30,700

Robert Luke Walker/amb
Rochester, NY 14650
Telephone: (585) 588-2739
Facsimile: (585) 477-1148

Enclosures: Copies of Cited References:
Computer Desktop Encyclopedia, 9th Edition, Pages 382 and 389
U.S Patent No. 5, 048,095